

closes and returns power to the appliance during the initial 10 second wait period. In all scenarios, the interrupt switch 20 closes only if the last received GAP level is sufficient to support the appliance load at the end of the shortened wait period dictated by the interrupt switch 20 decision process. Additional sequencing can be used to help insure that two interrupt switches, that had been open for more than the threshold period, do not enable their appliances at the same moment in the initial wait period.

A unique time slot within the initial wait period could be identified based on the interrupt switch priority. For example, the interrupt switches that had exceeded the threshold period could wait their priority number times one second or:

IF Interrupt Period > Threshold Period  
THEN 1 Second x Priority = Wait Period

In this scenario, each interrupt switch 20 having disabled power to its appliance longer than the threshold period, monitors a rise in GAP levels and closes the interrupt switch 20 after a number of seconds equal to its priority. In other words, interrupt switches 1, 2, 3, 4, etc. wait 1 second, 2 seconds, 3 seconds, 4 seconds etc. respectively, once the appliance disable period has exceeded the threshold. Those skilled in the art can identify numerous processes for wait sequences, all of which achieve the objective of the embodiment of the invention, of providing priority to appliances held without power for an extended period of time.

An optional feature for an interrupt switch 20 is a user warning system for when ever a critical, or threshold period, has been exceeded. In this scenario of the present invention, the interrupt switch 20 monitors the time it has been open, or held its appliance disabled, and when the critical time period is exceeded, a visual or audible notice is emitted as a warning to the occupants. This notice alerts the occupants of the home that the appliance has been held without power for the critical time period. Having been notified of the condition, occupants can turn off other appliances to lower the load on the generator until

the GAP level rose to the point where the interrupt switch enabled, or closed to returned power to the appliance. With the return of power, the visual or audible notification stops.

An alternate embodiment of the invention is the application of the interrupt switch 20 to control appliances during times when utility power is strained or in short supply.

Automatic appliances, or appliances with their own on/off control systems, can be wired on a separate circuit or circuits that are monitored in the same way the generator monitor 10, monitors the load on a generator. Interrupt switches support most, if not all the appliances on these circuits. The surge and continuous reference outputs are set similarly to the way they were set for the generator. The only difference is the reasoning used to determine the reference outputs. The reference outputs are set at the maximum load level intended for the home or facility, given the short supply of utility power. A generator monitor 10 measures the momentary load on the circuits (step 157 of Figure 3), calculates and transmits GAP levels in the same manner, but with the utility providing the power instead of the generator. This embodiment of the invention insures that the collective loads of the appliances on these circuits do not exceed the reference outputs resulting from the short supply of utility power. In turn the invention can be used to lower a home's peak load during times when utility power is in short supply or whenever a reason to conserve exists.

### **User Display**

The user display 30 informs the user of the generator's current capability with respect to the appliances in the general area of the display. The user display 30 quickly identifies the appliances that can and cannot be activated with the current load on the generator. Essentially the user display 30 reports the Generator's Available Power levels, GAP levels, in terms of a Yes or No, for each of the appliances near the display. User displays 30 may also report the GAP levels in Watts, however the presentation of GAP levels relative to local appliance loads is the easier to interpret. Additional functionality in the present invention can be the ability to detect the closed and open transmissions from the interrupt switches 20. This informs the user of the appliances with and without power.

Figure 6a shows the front and left view of a user display 30 that plugs into the wall outlet via plugs 311 and provides two outlets 310 for plugging in local appliances. The user display 30 receives through its antenna 312 the selected GAP level via radio wave and translates it into a series of lights that indicate the generator's available power, GAP. The number of lights illuminated indicates the GAP level. The light sequence 314 creates a thermometer like presentation of the GAP level. In figure 6a the black circles 316 to the right of "WATTS" levels (WATTS spelled vertically) 400, 800 and 1200 represent lights that are on. The open circles 316 to the right of "WATTS" levels 1600 and 2000 represent lights that are off. The number of lights, or height of the lights, indicate the GAP level. The light sequence 316 on the user display 30 in Figure 6a is reporting a GAP of 1200 Watts. In this particular display each light represents a 400-Watt increment of reported GAP, however any range of increments could be used within the scope of the present invention. The user display 30 has a rectangular area 315 to the right of the lights 316 intended to be an erasable writing area. This erasable writing area could be anything from a white board like surface with the intent of using an erasable marker, to an area sized for the application of a small piece of paper with an adhesive backing.

The user display 30 is designed to calibrate local appliances such as a toaster oven, microwave, hair dryer, curling iron, electric toothbrush, etc. as shown in the flow diagram of Figure 7a. The user first assigns the user display 30 to monitor a GAP level with dial 332. The user then plugs the user display 30 into an outlet. The user calibrates appliances, local to the display, by plugging them into one of the outlets 310 and pressing the "Measure Load" button 334. The appliance is turned on at which point the user display 30 measures the appliance load. The display lights the appropriate number of lights 316 on the display 314 representing either the actual load or the next higher incremental load of the appliance. The lights remain lit for a short period of time, long enough for the user to note the light level and record the name of the appliance next to the highest light illuminated by the measurement of the appliance. For example, a microwave at a 700-Watt load is measured and rounded up by the user display 30 to the second light indicating the next highest load on the display of 800 Watts. The user can